

REMARKS

Claims 1 and 9-27 remain pending in connection with the present application, with claims 1, 26, and 27 being independent. Claims 2-8 have been cancelled without prejudice or disclaimer of the subject matter contained therein. The correctly renumbered claims, as requested by the Examiner, are now present in connection with the present application.

Claim Amendments

Each of independent claims 1, 26, and 27 have been amended as will be explained hereafter.

Background

As discussed in the Background section of a present application, a general rule is that the armature, operating element, and contact (or contacts, if applicable) of a contactor are kept in a rest position in which the contact is opened, with the aid of a restoring spring force. If a drive coil of such a contactor is subject to a pull-in current, then the coil exerts a force on the armature. As a result, the armature is moved to the operating position where the contact is closed. If the pull-in current is turned off again, then the armature, the drive element, and the contact move back to the rest position by the restoring spring force. Normal operation is non-problematic.

Problems tend to occur in non-normal situations, where the armature, the operating element, and the contact are in their rest position and a current other than a zero current, that is lower than the pull-in current, acts upon the drive coil. The armature and other elements can be put into operating positions even if the current through the drive coil is only slightly below the pull-in current, for example at 92, 95, or 98% of the pull-in current. Further, the armature and other elements remain in the rest position if the current through the drive coil is only a relatively small fraction of the pull-in current, for example 10, 20, or 25% of the pull-in current. Thus,

below a certain current, the armature is not deflected from its rest position and above the second current, the armature will remove completely into its operating position.

There may be situations, however, such as with currents between 70-80% of the pull-in current for example, where the armature may be deflected from its rest position, but not moved to the operating position and thus may remain stuck in an intermediate position. Similarly, the armature may be deflected from its rest position and moved to essentially, but not completely, to its operating position, so that the contact is actuated only without pressure. Still further, in another range, the armature may be deflected from its rest position and moved completely to the operating position, so that the contact is closed for the pressure force. This is discussed, for example, in paragraphs [0005] and [0006] of the Substitute Specification of the present application.

Paragraph [0007] discusses a type of toggle behavior or tripping characteristic wherein when the favorable air of the contactor, the armature may always be in the rest position or deflected completely to its operating position. This type of toggle behavior is known for air-break contactors, but contactors with such a “favorable layout” is not known in the case of vacuum contactors.

Prior Art Rejections

The Examiner has rejected claims 1-27 under 37 U.S.C. § 103 as being unpatentable over GB 1,432,372 in view of CH 169467. This rejection is respectfully traversed.

Initially, Applicants note that each of independent claims 1, 26, and 27 have been amended to clarify that the invention is directed to a vacuum contactor that exhibits a type of toggle behavior. Specifically, the claims have been amended to clarify that “the vacuum contactor is adapted such that, for any current less than the pull-in current, the operating element

either remains in the element rest position or is deflected completely to the element operating position when the current is applied to the drive coil”. At least such a limitation is not taught or suggested by either of GB 1,432,372 or CH 169467, even assuming *arguendo* that they could be combined which Applicants do not admit.

Initially, GB 1,432,372 is directed only to a general contactor, and not a vacuum contactor. There is no mention anywhere in this reference of the contact being a vacuum contact and/or the contactor being a vacuum contactor. Further, this reference only covers the two operating states for the drive coil is admitted with the full pull-in current (line 8 on page 2) or the state where the drive coil is not admitted with the current at all (line 4 on page 2). As is explained above, the vacuum contact of the present application deals with possible intermediate states, namely states where the current is less than the pull-in current. This is not mentioned anywhere in GB 1,432,372. Further, the problem definition of the toggle behavior also does not implicitly follow from the division into an initial movement distance and a driving moving distance. According to lines 37-44 on page 1 of GB 1,432,372, a division serves a totally different purpose, namely to achieve these start-up delays of the contactor.

Further, Applicants respectfully submit that even assuming *arguendo* that CH 169467 could be combined with GB 1,432,372, which Applicants do not admit, CH 169467 would fail to makeup for at least the aforementioned deficiency of GB 1,432,372, for at least the following reasons.

CH 169467 also does not contain any reference to the toggle behavior problem definition. The only thing that is stated is that which occurs with a full pull-in current, and that which occurs without a pull-in current. There is no discussion or disclosure of the behavior of the contact which occurs during “intermediate currents”. Accordingly, for at least such reasons Applicants

respectfully submit that even assuming *arguendo* that CH 169467 could be combined with GB 1,432,372, which Applicants do not admit, the alleged combination would still fail to render any of independent claims 1, 26, or 27 obvious.

As is hopefully become clear through the aforementioned explanations, and as is hopefully become clear through the amending of each of claims 1, 26, and 27 to clarify the claims, it is important that the operating element, for any current less than the pull-in current (as essentially for each of the currents, including the various intermediate currents), that the operating element either remains in the rest position or is deflected completely to the element operating position when the current is applied to the drive coil. By the present Amendment, the claims have been clarified to emphasize this distinction and to emphasize their patentability over the prior art of record. Accordingly, allowance of each of these independent claims is respectfully requested.

Further with regard to the various dependent claims, these claims are allowable for at least the reasons previously presented regarding the corresponding independent claims, and are further allowable for limitations present therein. For example, with regard to claims 9, 10, 12, and 13 for example (as well as other claims), a particular ratio has been provided which decisively contributes to solving the problems set forth above. None of these ratios are taught or suggested by any of the prior art of record, including GB 1,432,372. GB 1,432,372 does not even disclose any corresponding solution with respect to any distance ratios. Accordingly, each of these claims are even further allowable over the prior art of record.

In addition, Applicants respectfully submit that the Examiner has not shown proper motivation as to why one of ordinary skill in the art would be taught or suggested to combine the two prior art references. The Examiner admits that GB 1,432,372 is not directed to a vacuum

switch, but merely states that since CH 169467 is directed or does disclose a vacuum contactor, then it would have been obvious to modify the non-vacuum switch to pertain to vacuum switch. Applicants submit, however, that the Examiner's provided no evidence of any such motivation, teaching, or suggestion. Absence such evidence, such a rejection is not proper. For example, in order to combine the prior art references, the Examiner must show some teaching, suggestion or motivation of the desirability of making the specific combination that was made by the Applicant. The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or in some cases, the nature of the problems to be solved. See In re Dembiczak, 50 USPQ2d 1614 (Fed. Cir. 1999) and In re Kotzab, 55 USPQ2d 1313 (Fed. Cir. 2000).

CONCLUSION

Accordingly, in view of the above amendments and remarks, reconsideration of the objections and rejections and allowance of each of claims 1 and 9-27 in connection with the present application is earnestly solicited.

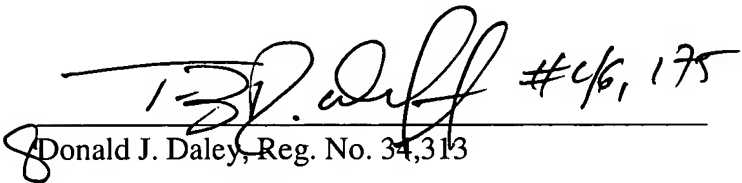
Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any

additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

HARNESS, DICKEY, & PIERCE, P.L.C.

By  #46,175
Donald J. Daley, Reg. No. 34,313

P.O. Box 8910
Reston, Virginia 20195
(703) 668-8000

DJD/bof